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Title: SYNERGISTICALLY ACTIVE MIXTURE WHICH INHIBITS HAIR GROWTH

(57) **Abstract:** The invention related to the use of an agent containing a synergistically active mixture which inhibits hair growth. Said mixture contains hydrolyzed soya protein and at least one extract of a plant which is selected from the group made up of Hypericum perforatum, Hamamelis virginiana, Amica montana and Salix alba. The mixture especially contains urea, menthol, propylene glycol and salicylic acid. Said agent is preferably used as a deodorant and/or an anti-perspirant or an aftershave.

SYNERGISTICALLY ACTIVE MIXTURE WHICH INHIBITS HAIR GROWTH

Invention Field

The invention is in the field of cosmetics and/or pharmacy and relates to the use of preparations containing a synergistically active mixture which inhibits hair growth, preferably in deodorants and/or anti-perspirants or after-shave.

State of the Art

Cosmetic preparations are available to the user today in a multiplicity of combinations. As a result, it is not only expected that these cosmetics display a specific skin care effect or remedy a specific deficiency, but more and more often products are demanded that display several properties at the same time and thus present an improved spectrum of performance. Similarly, the user can expect that the composition of the product has optimal dermatological tolerance, so that even sensitive users do not have an irritation reaction. In addition to this, however, the preparation should also fulfill other functions that increasingly lie in the area of skin care and in particular of protection. Of particular interest are substances that both represent active substances that offer properties desired for skin and hair, but at the same time also have a positive influence on the technical properties of the cosmetic product, such as stability to storage, stability to light, and formulatability, or at least do not impair them. In addition, good skin tolerance and in particular the use of natural products are called for by customers. In addition, it is desirable, by combining already-known active substances, or by discovering new fields of application of already-known classes of substances, to obtain distinctly better products. The combination of already-known active substances not infrequently leads to the occurrence of positive synergistic effects and the concentration of the active substances to be used can be decreased.

Plant extracts and their constituents find ever more frequent use in cosmetics and pharmacology. Plant extracts have been used for many years in different cultures for medicinal purposes, but also for cosmetic ones. Often, only very specific activities were known for these plant extracts and the field of use was very limited.

Especially in the border areas between cosmetics and pharmacy, a great interest is developing in toiletries that offer pharmaceutical efficacy with very minor side-effects. If these toiletries are offered in cosmetic preparations, then this offers to the user the possibility of relieving or preventing deficiency symptoms easily and without great expense.

It is often desirable for special cosmetic preparations that these preparations, besides the main desirable properties, display secondary effects that at the same time afford another positive skin care effect, or inhibit undesired effects such as for example strong hair growth of body hair.

A normal hair growth is usually tolerated, but in many cases excessive hair growth has a deleterious effect. Here it is sought to reduce the hair growth or to free parts of the body from hair. Different methods are known for this. For one, mechanical methods are to be cited, which can be very painful and time-consuming, and conceal the danger that the resulting small wounds become infected.

Methods are also known in which the hair is removed with hot or cold wax, with the removal here also only occurring from time to time, and above all skin irritations can occur.

Further, there is shaving, in which the hairs are only cut off and after a short time - and usually to an increased extent - grow back again. Many men and also women have skin irritation after shaving, especially with sensitive skin. Conventional after-shave preparations often ameliorate these skin irritations and refresh the skin, but they do not prevent the hair from growing back, often more strongly. Women in particular use a razor for the removal of hair, including from under the arms.

Description of Invention

The mission of the present patent application has consisted in providing preparations that in addition to skin care and protection characteristics above all display hair growth-inhibiting properties.

Another mission of the present patent application has consisted in providing preparations that display hair growth-inhibiting properties and this effect is used for example in cosmetic and/or pharmaceutical preparations that are used for parts of the body on which hair growth is not desired.

The subject of the invention is the use of a preparation containing a synergistically-active mixture that inhibits hair growth, containing hydrolyzed soy proteins and at least one extract of a plant that is chosen from the group constituted of Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba.

A preferred form of execution of the invention is the use of the above-described preparations in which the synergistically active mixture contains in addition substances that are selected from the group composed of urea, menthol, propylene glycol and salicylic acid.

It has surprisingly been found that by the use of a preparation that contains synergistically active mixtures for the inhibition of hair growth, containing hydrolyzed soy proteins and at least one

extract of a plant that is selected from the group formed by Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba, and in particular also urea, menthol, propylene glycol and salicylic acid, the inhibition of hair growth can be achieved.

The synergistic effect on the inhibition of hair growth is especially preferably achieved by means of mixtures that contain hydrolyzed soy proteins, extracts from Hypericum perforatum, extracts from Hamamelis virginiana, extracts from Arnica montana and extracts from Salix alba and also urea, menthol, propylene glycol and salicylic acid. A particularly preferred form of execution of the invention is therefore the use of preparations containing a synergistically active mixture that inhibits hair growth, containing hydrolyzed soy proteins, extracts from Hypericum perforatum, extracts from Hamamelis virginiana, extracts from Arnica montana and extracts from Salix alba and also urea, menthol, propylene glycol and salicylic acid.

The term plants, for the purposes of the present application, is understood to encompass both whole plants and also parts of plants (leaves, roots, flowers, bark) as well as their mixtures. The extracts have different compositions depending on the starting material selected and the method of extraction chosen.

A preferred form of execution of the invention is the use of the above described preparations containing the plant extracts mentioned, with the extracts from Hamamelis virginiana preferably stemming from the leaves of the plant, the extracts from Arnica montana preferably stemming from the flowers and the extracts from Salix alba preferably stemming from the bark.

The use of preparations containing the synergistically active mixtures described has above all the advantage that the hair growth of healthy hair is reduced, i.e. no painful or aggressive treatment of the skin takes place, so that there are no wounds or skin irritation. Only the hair growth is inhibited, with the inhibition being capable of leading to a complete standstill of the hair growth.

The synergistically active mixtures, besides the inhibiting properties on the hair growth, also have astringent, tonic, soothing, refreshing and wound-healing properties.

Soy Proteins

Soy proteins are preferably obtained from soy meal by extraction with demineralized water. For the hydrolysis, the aqueous solution of the proteins is enzymatically hydrolyzed with proteases. In principle, all proteases are suitable that act hydrolytically in either basic or alkaline [sic; should probably read acidic] medium. The proteins are according to the invention hydrolyzed at least once in basic medium, preferably at pH 8.7, and at least once in acid medium, preferably at pH 3.6. Depending on the enzyme, the pH values can differ.

The reaction temperature for the hydrolysis is between 20 and 80° C, preferably between 30 and 60°C and in particular at 54°C.

The term plant, for the purposes of the present invention, is to be understood to mean both whole plants and also parts of plants (leaves, roots, flowers) and their mixtures.

Hypericum Perforatum

The plant Hypericum perforatum L. (Hypericaceae) is also called St John's wort and belongs to the Guttiferae family. It is a widely distributed herbaceous plant with golden yellow panicular inflorescences. The plant contains up to 1% ethereal oil with alpha-pinene, monoterpenes and n-alkanes, and in addition the flavonoids quercetin, its 3-galactoside (hyperin) and rutin as well as quercetin and isoquercetin. Medicinally, the plant, collected when blooming, is used as a tea or in the form of tinctures obtained from it, as well as the clear deep-red oil obtained from the fresh blooms that contains ca. 0.1% hypericin.

Hamamelis Virginiana

Hamamelis virginiana is a North American bush (Hamamelidaceae) with yellow flowers in late spring, which is also called witchhazel bush and is also planted in Europe. Leaves and bark contain tannins; the leaves contain in addition flavone glycosides and ethereal oils. Hamamelis water, a distillate of Hamamelis leaves and stems has a toning action on the skin primarily due to its content of ethereal oils; tannins are contained in the highly colored extracts. Typical are hamamelis tannins, galloyl esters which on hydrolysis afford gallic acid and hamamelose ($C_6H_{12}O_6$, MW 180.16), a branched-chain sugar. According to the invention, the use of extracts from the leaves of the plant is preferred.

Hamamelis preparations are used for stopping minor bleeding, against varicose veins, hemorrhoids, hemorrhages, varices, intertrigo, pruritus, and burn and frost damage. When used internally, hamamelis extract, like other tannin-containing drugs, acts against diarrhea.

Arnica Montana

This is a herb of the dry meadows of the sub-alpine to alpine region with orange-yellow slightly aromatic-smelling, somewhat bitter-tasting flowers. Arnica montana contains 0.2-0.4% ethereal oil, alkaloids, especially sesquiterpene lactones (helenalin and derivatives), flavone glycosides (astragalin, isoquercetin). According to the invention, the use of extracts of the flowers of the plant is preferred.

Oily extracts (arnica oils), alcoholic extracts (arnicatin tincture) obtained from arnica flowers or roots, and ointments with Arnica, because of their circulation-stimulating action, are used externally in contusions, hemorrhages, etc. Internally, Arnica works favorably in gastro-intestinal

upsets, mouth and throat inflammations, but in concentrated form it is irritating to the skin and mucosa.

Salix Alba

The Salix genus, dioecious trees or shrubs, is widely distributed in the northern hemisphere and is divided into about 500 types. The Salix varieties are also called willows, and the bark of these willows is peeled from two- to three-year-old branches and contains 1-12% salicin or salicyl alcohol derivatives, other phenolic compounds and 8-20% tannins. It represents so-to-speak a "pro-drug" for salicylic acid and was used correspondingly against fever, rheumatic disorders, headaches and inflammations. Because of the comparatively poor tolerance of willow bark, it has been superseded in therapy by acetylsalicylic acid or arylacetic acids (e.g. diclofenac, ibuprofen).

According to the invention, the use of extracts of the bark of the plant is preferred.

Extraction

The preparation of the extracts to be used in accordance with the invention results through the usual methods for extraction of plants or parts of plants. With regard to the suitable conventional extraction methods, such as maceration, re-maceration, digestion, moving maceration, spin effect extraction, ultrasound extraction, counter-current extraction, percolation, re-percolation, evacolation (extraction under diminished pressure), diacolation and solid-liquid extraction under continuous reflux which is carried out in a Soxhlet extractor, which are familiar to one skilled in the art and in principle are all applicable, reference is to be made, for example, to **Hagers Handbook of Pharmaceutical Practice** (5th Ed., vol. 2, pp. 1026-1030, Springer Verlag, Berlin-Heidelberg-New York 1991). Fresh or dried plants or parts of plants can be used as starting materials, but usually plants or parts of plants are mechanically ground up and if necessary de-fatted before the extraction. For this, all grinding methods known to one skilled in the art are suitable; grinding with an apparatus containing a blade is cited as an example.

Used as solvent for carrying out the extractions can be preferably water, organic solvents or mixtures of organic solvents and water, in particular propylene glycol or lower molecular weight alcohols, esters, ethers, ketones or halogen-containing hydrocarbons with varying water content (distilled or undistilled), preferably aqueous alcoholic solutions of varying water content. Especially preferred is extraction with distilled water, methanol, ethanol, propanol, butanol and its isomers, acetone, propylene glycols, polyethylene glycols, ethyl acetate, dichloromethane, trichloromethane and their mixtures, in particular with a mixture of distilled water and propylene glycol. The extraction takes place as a rule at 20 to 100°C, preferably at 20 to 80°C. In one possible form of execution, the extraction occurs under inert gas atmosphere to avoid oxidation of the contents of the extract. The extraction times are adjusted by one skilled in the art depending on the starting material, method of extraction, extraction temperature, the ratio of solvent to raw material, etc.

After the extraction, the crude extracts obtained can if necessary be subjected to further standard steps, such as for example purification, concentration and/or decolorization. If desired, the extracts so prepared can for example be subjected to selective separation of individual undesired contents, for example by filtration. The extraction can take place up to any desired degree of extraction, but is usually carried out to exhaustion. The present invention encompasses the recognition that the extraction conditions and the yields of the final extract can be selected depending on the desired field of use. If desired, the extracts can finally be subjected for example to spray- or freeze-drying. The amount of the plant extract used in the preparations referred to is determined by the concentration of the individual content materials and on the type of applications of the extracts.

For the purposes of the invention, the term extract or plant extract designates both dried extracts and also mixtures of dried extracts with solvent, preferably water, especially a mixture of water and propylene glycol.

The use according to the invention of preparations containing the described synergistically active mixture that inhibits hair growth can in principle be used for all cosmetic and/or pharmaceutical preparations that are used for parts of the body on which hair growth is unwelcome.

In a specific form of execution of the invention, the preparations according to the invention are used in deodorants and/or antiperspirants. The synergistically active mixture described above, contained in the deodorants and/or antiperspirants, containing hydrolyzed soy proteins and at least one extract of a plant that is selected from the group constituted of Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba, as well as in particular urea, menthol, propylene glycol and salicylic acid, thereby affords for deodorants and/or antiperspirants in addition to other effects the desired secondary effect of an inhibition of unwelcome underarm hairiness. Preferred thereby is the use of preparations containing a synergistically active mixture of hydrolyzed soy proteins, Hypericum perforatum extract, Hamamelis virginiana extract, Arnica montana extract and Salix alba extract, as well as urea, menthol, propylene glycol and salicylic acid.

Deodorants and Germ-Inhibiting Preparations

Cosmetic deodorants (deodorizers) act against body odors, mask them or eliminate them. Body odors arise due to the action of skin bacteria on apocrine sweat, whereby unpleasant-smelling degradation products are formed. Accordingly. deodorants contain active substances that function as germ-inhibitors, enzyme inhibitors, odor absorbers or odor maskers.

➢ **Germ-inhibiting preparations**

Suitable as germ-inhibiting preparations are basically all substances effective against gram positive bacteria such as for example 4-hydroxybenzoic acid and its salts and esters, N-(4-

chlorophenyl)-N'-(3,4-dichlorophenyl)urea, 2,4,4'-trichloro-2'-hydroxy-diphenyl ether (Triclosan), 4-chloro-3,5-dimethylphenol, 2,2'-methylene-bis(6-bromo-4-chlorophenol), 3-methyl-4-(1-methylethyl)phenol, 2-benzyl-4-chlorophenol, 3-(4-chlorophenoxy)-1,2-propanediol, 3-iodo-2-propinylbutylcarbamate, chlorhexidine, 3,4,4'-trichlorocarbanilide (TTC), antibacterial perfumes, thymol, thyme oil, eugenol, clove oil, menthol, mint oil, farnesol, phenoxyethanol, glycerol monocaprate, glycerol monocaprylate, glycerol monolaurate (GML), diglycerol monocaprate (DMC), salicylic acid N-alkylamides such as for example salicylic acid n-octylamide or salicylic acid n-decylamide.

➢ <u>Enzyme inhibitors</u>

Suitable enzyme inhibitors are for example esterase inhibitors. These are preferably trialkyl citrates such as trimethyl citrate, tripropyl citrate, triisopropyl citrate, tributyl citrate and in particular triethyl citrate (Hydagen® CAT). The substances inhibit enzyme activity and thereby reduce odor formation. Other substances that are considered as esterase inhibitors are sterol sulfates or phosphates, such as for example the sulfate or phosphate of lanosterol, cholesterol, campestrol, stigmasterol and sitosterol, dicarboxylic acids and their esters, such as for example glutaric acid, glutaric acid monoethyl ester, glutaric acid diethyl ester, adipic acid, adipic acid monoethyl ester, adipic acid diethyl ester, malonic acid and malonic acid diethyl ester, hydroxycarboxylic acids and their esters such as for example citric acid, malic acid, tartaric acid or tartaric acid diethyl ester, and also zinc glycinate.

➢ <u>Odor absorbers</u>

Suitable as odor absorbers are substances that can absorb and largely hold odor-forming compounds. They lower the partial pressure of the individual components and thus also reduce their rate of diffusion. It is important that perfumes must thereby remain unaffected. Odor absorbers have no efficacy against bacteria. They contain for example as the main component a complex zinc salt of ricinoleic acid or special largely odor-neutral fragrances that are known by one skilled in the art as "fixatives," such as for example extracts of labdanum or styrax or certain abietic acid derivatives. Functioning as odor maskers are perfumes or perfume oils which in addition to their function as odor maskers lend their respective fragrance notes to the deodorants. Perfume oils to be cited are for example mixtures of natural and synthetic perfumes. Natural perfumes are extracts of flowers, stems and leaves, fruits, fruit peels, roots, woods, herbs and grasses, needles and branches as well as resins and balsams. Also suitable are animal raw materials such as for example civet and castoreum. Typical synthetic perfume compounds are products of the ester, ether, aldehyde, ketone, alcohol and hydrocarbon types. Perfume substances of the ester type are for example benzyl acetate, p-tert-butylcyclohexyl acetate, linalyl acetate, phenylethyl acetate, linalyl benzoate, benzyl formate, allylcyclohexyl propionate, styrallyl propionate and benzyl salicylate. The ethers include for example benzyl ethyl ether, the aldehydes are for example the linear alkanals with 8 to 18 carbon atoms, citral, citronellal, citronellyloxy acetaldehyde, cyclamenaldehyde, hydroxycitronellal, lilial and bourgeonal, the

ketones are for example the ionones and methyl cedryl ketone, the alcohols are anethole, citronnelol, eugenol, isoeugenol, geraniol, linalool, phenylethyl alcohol, and terpineol, and the hydrocarbons include mainly the terpenes and balsams. Preferably, however, mixtures of different perfumes are used that together produce an appealing fragrance note. Also ethereal oils of low volatility that are mostly used as aroma components are suitable as perfume oils, e.g. sage oil, camomile oil, clove oil, balm oil, mint oil, cinnamon leaf oil, linden flower oil, juniper berry oil, vetiveria oil, olibanum oil, galbanum oil, labdanum oil and lavendin oil. Preferably used are bergamot oil, dihydromyrcenol, lilial, lyral, citronellol, phenylethyl alcohol, α-hexylcinnamaldehyde, geraniol, benzyl acetone, cyclamenaldehyde, linalool, Boisambrene Forte, ambroxan, indole, hedione, sandelice, lemon oil, mandarin oil, orange oil, allyl amyl glycolate, cyclovertal, lavendin oil, muscatel sage oil, β-damascone, geranium oil Bourbon, cyclohexyl salicylate, Vertofix Coeur, Iso-E-Super, Fixolide NP, Evernyl, Iraldein gamma, phenylacetic acid, geranyl acetate, benzyl acetate, rose oxide, Romilat, Irotyl and Floramat alone or in mixtures.

➢ <u>Antiperspirants</u>

Antiperspirants, by influencing the activity of the eccrine sweat glands, reduce the formation of sweat and thus counteract underarm wetness and body odor. Aqueous or water-free formulations of antiperspirants typically contain the following ingredients:

➢ astringents
➢ oil components
➢ non-ionic emulsifiers
➢ co-emulsifiers
➢ viscosity controlling agents
➢ adjuvants such as thickeners or complexing preparations, and/or
➢ non-aqueous solvents such as ethanol, propylene glycol and/or glycerol.

Especially suitable as astringents are salts of aluminum, zirconium or zinc. Such suitable anti-perspirant active substances are for example aluminum chloride, aluminum chlorohydrate, aluminum dichlorohydrate, aluminum sesquichlorohydrate and their complex compounds e.g. with propylene glycol-1,2, aluminum hydroxyallantoinate, aluminum chloride tartrate, aluminum zirconium trichlorohydrate, aluminum zirconium tetrachlorohydrate, aluminum-zirconium pentachlorohydrate, and their complex compounds, e.g. with amine acids such as glycine. Besides these, antiperspirants can contain the usual oil-soluble and water-soluble adjuvants in small amounts. Such oil-soluble adjuvants can for example be:

➢ anti-inflammatory, skin-protective or sweet-smelling ethereal oils
➢ synthetic skin protective substances and/or
➢ oil-soluble perfume oils.

Common water-soluble additives are for example preservatives, water-soluble fragrances, pH adjusting preparations, e.g. buffering mixtures, water-soluble thickeners, e.g. water-soluble natural or synthetic polymers such as for example xanthan gum, hydroxyethyl cellulose, polyvinylpyrrolidone or high molecular weight polyethylene oxides.

In another form of execution of the invention, the preparations are used according to the invention in after-shave lotion. The synergistically active mixture described above, contained in the aftershave lotion, containing hydrolyzed soy proteins and at least one extract of a plant that is selected from the group constituted of Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba, as well as in particular urea, menthol, propylene glycol and salicylic acid thus affords for aftershave, besides other effects, the desired secondary effect of an inhibition of undesired hairiness, particularly beard growth. Preferred here is the use of preparations containing a synergistically active mixture of hydrolyzed soy protein, Hypericum perforatum extract, Hamamelis virginiana extract, Arnica montana extract and Salix alba extract, as well as urea, menthol, propylene glycol and salicylic acid.

<u>After-shave lotion</u>

The cosmetic preparations that are called after-shave lotions for the purposes of the invention and which are used after wet- or dry-shaving, include in principle all preparations that are used after shaving, in particular shaving water, shaving lotions, after-shave gels and after-shave balsam, sprays, foam, creams, sticks, liquid and solid powder. They can be provided with very different fragrance notes. The after-shave products used after wet- or dry-shaving are preparations that at least alleviate skin irritation after shaving, neutralize the basic shaving preparations, restore the biological acidic mantle of the skin, and have a refreshing, cooling and disinfecting action. An aftershave can, besides the synergistically active mixtures, be composed of glycerol (or glycol derivatives), citric acid, alum, disinfectants, perfumes and alcohol. A product that can be sprayed from spray cans is obtained for example by addition of 85% alcohol, perfume, polyvinylpyrrolidone and gaseous propellant.

The multiple application possibilities according to the invention of preparations containing a synergistically active mixture which inhibits hair growth, containing hydrolyzed soy proteins and at least one extract of a plant that is selected from the group constituted by Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba, as well as in particular urea, menthol, propylene glycol and salicylic acid are very attractive for the market and for the user. The complex task of the invention could thus be solved by the use of this preparation.

A preferred form of execution of the invention is the use of the above-described preparations in which the components contained in the synergistically active mixture in the preparations have the following composition:

(a) 0.01 to 40 % by weight of hydrolyzed proteins from soy extract, preferably from 0.01 to 36.3% by weight, from 0.1 to 10% by weight, from 0.7 to 7.3% by weight, particularly preferably from 1.5 to 3.6% by weight and in particular 3.63% by weight

(b) 0.005 to 10 % by weight of Hypericum perforatum extract, preferably from 0.01 to 7% by weight, from 0.07 to 3.5% by weight, particularly preferably from 0.35 to 0.7% by weight and in particular 0.35% by weight and/or

(a) 0.005 to 10 % by weight of Hamamelis virginiana extract, preferably from 0.01 to 6% by weight, from 0.06 to 3% by weight, particularly preferably from 0.3 to 0.7% by weight and in particular 0.3% by weight and/or

(b) 0.005 to 10 % by weight of Arnica montana extract, preferably from 0.01 to 6% by weight, from 0.06 to 3% by weight, particularly preferably from 0.3 to 0.7% by weight and in particular 0.3% by weight and/or

(c) 0.001 to 10 % by weight of Salix alba extract, preferably from 0.005 to 3% by weight, from 0.01 to 1.5% by weight, particularly preferably from 0.15 to 0.3% by weight and in particular 0.15% by weight and if necessary

(d) 0.0005 to 10 % by weight of menthol, preferably from 0.005 to 1% by weight, from 0.01 to 0.5% by weight, particularly preferably from 0.05 to 0.1% by weight and in particular 0.05% by weight and

(e) 0.0005 to 10 % by weight of urea, preferably from 0.01 to 4% by weight, from 0.04 to 2.0% by weight, particularly preferably from 0.2 to 0.28% by weight and in particular 0.2% by weight and

(f) 0.05 to 40 % by weight of propylene glycol, preferably from 0.1 to 35% by weight, from 0.3 to 25% by weight, particularly preferably from 1 to 10% by weight and in particular 1.5% by weight and

(g) 0.0005 to 3% by weight of salicylic acid, preferably from 0.001 to 0.25% by weight, from 0.0025 to 0.125% by weight, particularly preferably from 0.0125 to 0.025% by weight and in particular 0.0125% by weight,

provided that if necessary the amounts are made up to 100% by weight with water and/or other adjuvants and additives.

The components can be used as the dry substance or in solution. With the hydrolyzed proteins from soy extract, the use of aqueous solutions is preferred, in particular of aqueous solutions that have a dry substance content of 8 to 10% by weight, preferably 9% by weight, and a protein content of 3 to 5% by weight, preferably 4% by weight.

The extracts from Hypericum perforatum, Hamamelis virginiana, Arnica [typo in original] montana and Salix alba can be used as dry substance or as a solution. Both possibilities are considered extracts for the purposes of the invention. Use as a solution is preferred. Preferred as the solvent is water and/or a water-propylene glycol mixture. The ratio of water to propylene glycol can be between 1:1.5 and 2:1, preferably 1:1. The content of dry substance in this extract to be used is between 1 and 5% by weight, preferably between 1.5 and 3% by weight, in particular 2% by weight.

A preferred form of execution of the invention is the use of the above-described preparations, with the synergistically active mixture having the following composition:

72.75% by weight of hydrolyzed soy protein
7% by weight of Hypericum perforatum extract and
6% by weight of Hamamelis virginiana extract and
6% by weight of Arnica montana extract and
3% by weight of Salix alba extract and
4% by weight urea and
1% by weight of menthol and
0.25% by weight of salicylic acid.

The use of hydrolyzed soy protein corresponds preferably to an aqueous solution that displays a protein content of 4% and a dry substance content of 9%. The extracts from Hypericum perforatum are preferably used as a solution, with the solvent consisting of water and propylene glycol. Preferred is a mixture of equal parts water and propylene glycol. The fraction of dry substance is 2% by weight.

The extracts from Hamamelis virginiana are preferably used as a solution, with the solvent consisting of water and propylene glycol. Preferred is a mixture of equal parts water and propylene glycol. The fraction of dry substance is 2% by weight.

The extracts from Arnica montana are preferably used as a solution, with the solvent consisting of water and propylene glycol. Preferred is a mixture of equal parts water and propylene glycol.

The extracts from Salix alba are preferably used as a solution, with the solvent consisting of water and propylene glycol. Preferred is a mixture of equal parts water and propylene glycol. The fraction of dry substance is 1.5% by weight.

The fraction of propylene glycol in the mixture is 25 to 40% by weight.

This mixture was incorporated into cosmetic preparations preferably with 5% by weight at temperatures below 50°C. This mixture is soluble in water but insoluble in fats and oils.

The invention extracts have an active substance content in the extracts of 1 to 100% by weight, preferably 10 to 95% by weight, in particular 20 to 80% by weight. The active substance content for the purposes of the invention designates the sum of all active substances present in the extract, based on the dry weight of the extract.

An active substance for the purposes of the invention refers to the components contained in the extract, even when their content and identity have not yet been established by common methods known to one skilled in the art. Among active substances in the sense of the invention, moreover, are all constituents contained in the extract, the action of which is either already known or for which the action has still not been able to be established by standard methods known to one skilled in the art.

Active substance for the purposes of the invention refers to the fraction of substances as well as adjuvants and additives that are contained in the preparation, with the exception of the water added in addition.

The total fraction of adjuvants and additives can be 1 to 50, preferably 5 to 40% by weight, based on the final mixture of the cosmetic and/or dermatological preparations. The production of the preparations can result by standard cold or hot processes.

The present invention includes the recognition that due to the interaction of the constituents of the synergistically active mixture, especially active cosmetic and/or pharmaceutical preparations are obtained. They show an excellent skin-care action with simultaneous high skin compatibility. In addition, they display good stability, especially towards oxidative degradation of the products.

The concepts preparations, final preparations and agent are equivalent for the purposes of the invention.

The preparations containing a synergistically active mixture which inhibits hair growth can be used for the production of cosmetic and/or pharmaceutical preparations such as for example sprays, creams, gels, lotions, alcoholic and aqueous-alcoholic solutions, emulsions, wax/fat masses, stick preparations, powders or ointments. These preparations can moreover contain as additional adjuvants and additives mild surfactants, oily substances, emulsifiers, pearly luster waxes, viscosity controlling agents, thickeners, superfatting preparations, stabilizers, polymers, silicone compounds, fats, waxes, UV screens and anti-oxidants, lecithins, phospholipids, biogenic active substances, film-formers, swelling preparations, artificial tanning products, tyrosinase inhibitors (depigmentation preparations), hydrotropes, solubilizers, preservatives, perfume oils, coloring agents and the like.

Surfactants

Contained as surface active substances can be anionic, non-ionic, cationic and/or amphoteric or amphoteric [sic; should read zwitterionic] surfactants, the fraction of which in the preparations is usually about 1 to 70, preferably 5 to 50, and in particular 10 to 30% by weight. Typical examples of anionic surfactants are soaps, alkylbenzenesulfonates, alkane sulfonates, olefin sulfonates, alkyl ether sulfonates, glycerol ether sulfonates, α-methyl ester sulfonates, sulfo-fatty acids, alkyl sulfates, fatty alcohol ether sulfates, glycerol ether sulfates, fatty acid ether sulfates, hydroxy mixed ether sulfates, monoglyceride(ether) sulfates, fatty acid amide (ether) sulfates, mono- and dialkylsulfosuccinates, mono- and dialkylsulfosuccinamates, sulfotriglycerides, amide soaps, ether carboxylic acids and their salts, fatty acid isethionates, fatty acid sarcosinates, fatty acid taurides, N-acylamino acids, such as for example acyl lactylates, acyl tartrates, acyl glutamates, and acyl aspartates, alkyl oligoglucoside sulfates, protein fatty acid condensates (in particular plant products based on wheat) and alkyl(ether) phosphates. To the extent that the anionic surfactants contain polyglycol ether chains, these can display a conventional, but preferably limited homolog distribution. Typical examples of non-ionic surfactants are fatty alcohol polyglycol ethers, alkylphenol polyglycol ethers, fatty acid polyglycol esters, fatty acid amide polyglycol ethers, fatty amine polyglycol ethers, alkoxylated triglycerides, mixed ethers or mixed formals, if necessary partially oxidized alk(en)yl oligoglycosides or glucuronic acid derivatives, fatty acid N-alkylglucamides, protein hydrolyzates (particularly plant products based on wheat), polyol fatty acid esters, sugar esters, sorbitan esters, polysorbates and amine oxides. To the extent that the non-ionic surfactants contain polyglycol ether chains, these can display a conventional, but preferably limited homolog distribution. Typical examples of cationic surfactants are quaternary ammonium compounds, such as for example dimethyldistearyl ammonium chloride, and esterquats, in particular quaternized fatty acid trialkanolamine ester salts. Typical examples of amphoteric or zwitterionic surfactants are alkylbetaines, alkylamidobetaines, aminopropionates, aminoglycinates, imidazolium betaines and sulfobetaines. The surfactants referred to are exclusively known compounds. With respect to the structure and preparation of these substances, the relevant survey works are to be referred to, for example **J. Falbe (Ed.), "Surfactants in Consumer products," Springer Verlag, Berlin, 1987, pp. 54-124,** or **J. Falbe (Ed.), "Catalysts, surfactants and mineral oil additives," Thieme Verlag, Stuttgart, 1978, pp. 1213-217.** Typical examples of particularly suitable mild, i.e. particularly skin-compatible surfactants are fatty alcohol polyglycol ether sulfates, monoglyceride sulfates, mono- and/or dialkylsulfosuccinates, fatty acid isethionates, fatty acid sarcosinates, fatty acid taurides, fatty acid glutamates, α-olefin sulfonates, ether carboxylic acids, alkyl oligoglucosides, fatty acid glucamides, alkylamidobetaines, amphoacetals and/or protein fatty acid condensates, the latter preferably based on wheat proteins.

Oils

Considered as oils are for example Guerbet alcohols based on fatty alcohols with 6 to 18, preferably 8 to 10 carbon atoms, esters of linear C_6-C_{22}-fatty acids with linear or branched C_6-C_{22}-fatty alcohols or esters of branched C_6-C_{13}-carboxylic acids with linear or branched C_6-C_{22}-fatty

alcohols such as for example myristyl myristate, myristyl palmitate, myristyl stearate, myristyl isostearate, myristyl oleate, myristyl behenate, myristyl erucate, cetyl myristate, cetyl palmitate, cetyl stearate, cetyl isostearate, cetyl oleate, cetyl behenate, cetyl erucate, stearyl myristate, stearyl palmitate, stearyl stearate, stearyl isostearate, stearyl oleate, stearyl behenate, stearyl erucate, isostearyl myristate, isostearyl palmitate, isostearyl stearate, isostearyl isostearate, isostearyl oleate, isostearyl behenate, isostearyl oleate [sic; should read erucate], oleyl myristate, oleyl palmitate, oleyl stearate, oleyl isostearate, oleyl oleate, oleyl behenate, oleyl erucate, behenyl myristate, behenyl palmitate, behenyl stearate, behenyl isostearate, behenyl oleate, behenyl behenate, behenyl erucate, erucyl myristate, erucyl palmitate, erucyl stearate, erucyl isostearate, erucyl oleate, erucyl behenate, erucyl erucate. Besides this, suitable esters of linear C_6-C_{22}-fatty acids with branched alcohols, particularly 2-ethylhexanol, esters of $C_{18}C_{38}$-alkylhydroxycarboxylic acids with linear or branched C_6-C_{22}-fatty alcohols (see **DE 19756377 A1**), in particular dioctyl malate, esters of linear and/or branched fatty acids with polyvalent alcohols (e.g. propylene glycol, dimerdiol or trimertriol) and/or Guerbet alcohols, triglycerides based on C_6-C_{10}-fatty acids, liquid mono-/di-/triglyceride mixtures based on C_6-C_{18}-fatty acids, esters of C_6-C_{22}-fatty alcohols and/or Guerbet alcohols with aromatic carboxylic acids, in particular benzoic acid, esters of C_2-C_{12}-dicarboxylic acids with linear or branched alcohols with 1 to 22 carbon atoms or polyols with 2 to 10 carbon atoms and 2 to 6 hydroxyl groups, plant oils, branched primary alcohols, substituted cyclohexanes, linear and branched C_6-C_{22}-fatty alcohol carbonates such as for example dicaprylyl carbonate (Cetiol® CC), Guerbet carbonates based on fatty alcohols with 6 to 18, preferably 8 to 10 C atoms, esters of benzoic acid with linear and/or branched C_6-C_{22}-alcohols (e.g. Finsolv® TN), linear or branched, symmetrical or asymmetrical dialkyl ethers with 6 to 22 carbon atoms per alkyl group, such as for example dicaprylyl ether (Cetiol® OE), ring-opening products of epoxided fatty acid esters with polyols, silicone oils (cyclomethicone, silicon methicone types, etc.) and/or aliphatic or napthenic hydrocarbons, such as for example squalane, squalene or dialkylcyclohexanes.

Emulsifiers

Considered as emulsifiers are for example non-ionic surfactants from at least one of the following groups:

- addition products of 2 to 30 mol ethylene oxide and/or 0 to 5 mol propylene oxide to linear fatty alcohols with 8 to 22 C atoms, to fatty acids with 12 to 22 C atoms, to alkylphenols with 8 to 15 C atoms in the alkyl group, and also alkylamines with 8 to 22 carbon atoms in the alkyl residue;

- alkyl- and/or alkenyl oligoglycosides with 8 to 22 carbon atoms in the alkyl(en)yl residue and their ethoxylated analogs;

- addition products of 1 to 15 mol ethylene oxide to castor oil and/or hardened castor oil;

- addition products of 15 to 60 mol ethylene oxide to castor oil and/or hardened castor oil;
- partial esters of glycerol and/or sorbitan with unsaturated linear or saturated branched fatty acids with 12 to 22 carbon atoms and/or hydroxycarboxylic acids with 3 to 18 carbon atoms and their adducts with 1 to 30 mol ethylene oxide;
- partial esters of polyglycerol (average degree of self-condensation 2 to 8), polyethyleneglycol (molecular weight 400 to 5000), trimethylolpropane, pentaerythritol, sugar alcohols (e.g. sorbitol), alkyl glucosides (e.g. methylglucoside, butylglucoside, laurylglucoside) and polyglucosides (e.g. cellulose) with saturated and/or unsaturated, linear or branched fatty acids with 12 to 22 carbon atoms and/or hydroxycarboxylic acid with 3 to 18 carbon atoms and their adducts with 1 to 30 mol ethylene oxide;
- mixed esters of pentaerythritol, fatty acids, citric acid and fatty alcohols in accordance with **DE 1165574 PS** and/or mixed esters of fatty acids with 6 to 22 carbon atoms, methylglucose and polyols, preferably glycerol or polyglycerol;
- mono-, di- and trialkylphosphates and also mono-, di- and tri-PEG-alkylphosphates and their salts;
- wool wax alcohols;
- polysiloxane-polyalkyl-polyether-copolymers and corresponding derivatives;
- block copolymers, e.g. polyethyleneglycol-30 dipolyhydroxystearate;
- polymer emulsifiers, e.g. Pemulen types (TR-1, TR-2) from Goodrich;
- polyalkyleneglycols, and
- glycerol carbonate.

The addition products of ethylene oxide and/or propylene oxide to fatty alcohols, fatty acids, alkylphenols or to castor oil are known, commercially available products. They involve mixtures of homologs with an average degree of alkoxylation corresponding to the ratio of the quantities of ethylene oxide and/or propylene oxide and substrate with which the addition reaction is carried out. $C_{12/18}$-Fatty acid mono- and diesters of addition products of ethylene oxide to glycerol are known from **DE 2024051 PS** as emollients for cosmetic preparations.

Allyl- and/or alkylene oligoglycosides, their preparation and their use are known from the state of the art. Their preparation results in particular by reacting glucose or oligosaccharides with primary alcohols with 8 to 18 carbon atoms. As far as the glycoside residue is concerned, both

monoglycosides in which a cyclic sugar residue is bound glycosidically to the fatty alcohol, and also oligomeric glycosides with an oligomerization rate of up to preferably about 8 are suitable. The oligeromerization rate is then a statistical average that is based on a common homolog distribution for this type of technical product.

Typical examples of suitable partial glycosides are hydroxystearic acid monoglyceride, hydroxystearic acid diglyceride, isostearic acid monoglyceride, isostearic acid diglyceride, oleic acid monoglyceride, oleic acid diglyceride, ricinoleic acid monoglyceride, ricinoleic acid diglyceride, linoleic acid monoglyceride, linoleic acid diglyceride, linolenic acid monoglyceride, linolenic acid diglyceride, erucic acid monoglyceride, erucic acid diglyceride, tartaric acid monoglyceride, tartaric acid diglyceride, citric acid monoglyceride, citric acid diglyceride, malic acid monoglyceride, malic acid diglyceride, and their technical mixtures which can secondarily still contain small amounts of triglyceride from the production process,. Also suitable are addition products of 1 to 30, preferably 5 to 10 moles ethylene oxide to the partial glycerides cited.

Used as sorbitan esters are sorbitan monoisostearate, sorbitan sesquiisostearate, sorbitan diisostearate, sorbitan triisostearate, sorbitan monooleate, sorbitan sesquioleate, sorbitan dioleate, sorbitan trioleate, sorbitan monoerucate, sorbitan sesquierucate, sorbitan dierucate, sorbitan trierucate, sorbitan monoricinoleate, sorbitan sesquiricinoleate, sorbitan diricinoleate, sorbitan triricinoleate, sorbitan monohydroxystearate, sorbitan sesquihydroxystearate, sorbitan dihydroxystearate, sorbitan trihydroxystearate, sorbitan monotartrate, sorbitan sesquitartrate, sorbitan ditartrate, sorbitan tritartrate, sorbitan monocitrate, sorbitan sesquicitrate, sorbitan dicitrate, sorbitan tricitrate, sorbitan monomaleate, sorbitan sesquimaleate, sorbitan dimaleate, sorbitan trimaleate, and their technical mixtures. Also suitable are addition products of 1 to 30, preferably 5 to 10 moles ethylene oxide to the sorbitan esters cited.

Typical examples of suitable polyglycerol esters are polyglyceryl-2 dipolyhydroxystearate (Dehymuls® PGPH), polyglycerol-3 diisostearate (Lameform® TGI), polyglyceryl-4 isostearate (Isolan® GI 34), polyglyceryl-3 oleate, diisostearoyl polyglyceryl-3 diisostearate (Isolan® PDI), polyglyceryl-3 methylglucose distearate (Tego Care® 450), polyglyceryl-4 beeswax (Cara Bellina®), polyglyceryl-3 caprate (Polyglycerol Caprate T2010/90), polyglyceryl-3 cetyl ether (Chimexane® NL), polyglyceryl-3 distearate (Cremophor® GS 32), and polyglyceryl polyricinoleate (Admul® WOL 1403), polyglyceryl dimerate isostearate and their mixtures. Examples of other suitable polyol esters are the mono-, di- and triesters of trimethylolpropane or pentaerythritol with lauric acid, coco fatty acids, tallow fatty acids, palmitic acid, stearic acid, oleic acid, behenic acid, and the like, if necessary reacted with 1 to 30 moles ethylene oxide.

In addition, zwitterionic surfactants can be used as emulsifiers. Zwitterionic surfactants are those surface active compounds that have in the molecule at least one quaternary ammonium group and at least one carboxylate and one sulfonate group. Especially suitable zwitterionic surfactants are the so-called betaines such as N-alkyl-N,N-dimethylammonium glycinates, for example coco-alkyldimethylammonium glycinate, N–acylaminopropyl-N,N-dimethylammonium glycinates, for example coco-acylaminopropyldimethylammonium glycinate and 2-alkyl-3-carboxymethyl-3-

hydroxyethylimidazoline with 8 to 18 C atoms in the alkyl or acyl group as well as coco-acylaminoethylhydroxyethylcarboxymethyl glycinate. Especially preferred is the fatty acid amide derivative known by the CTFA designation Cocamidopropyl Betaine. Also suitable as emulsifiers are ampholytic surfactants. Ampholytic surfactants are understood to be those surface active compounds that in addition to a $C_{8/18}$-alkyl or -acyl group in the molecule contain at least one free amino group and at least one -COOH or -SO_3H group, and are capable of forming internal salts. Example of suitable ampholytic surfactants are N-alkylglycines, N–alkylpropionic acids, N-alkylaminobutyric acids, N-alkylaminodipropionic acids, N-hydroxyethyl-N-alkylamidopropylglycines, N-alkyltaurines, N-alkylsarcosines, 2-alkylaminopropionic acids and alkylaminoacetic acids with about 8 to 18 C atoms in the alkyl group. Especially preferred ampholytic surfactants are N-coco-alkylaminopropionate, coco-acylaminoethylaminopropionate and $C_{12/18}$-acylsarcosine. Finally, cationic surfactants are suitable as emulsifiers, with those of the esterquat type, preferably methylquaternized difatty acid triethanolamine ester salts, being particularly preferred.

Fats and Waxes

Typical examples of fats are glycerides, i.e. solid or liquid plant or animal products that basically consist of mixed glycerol esters of higher fatty acids; waxes are among others, natural waxes, such as for example candelilla wax, carnauba wax, japan wax, esparto grass wax, cork wax, guarum wax, rice germ oil wax, sugarcane wax, ouricury wax, montan wax, beeswax, shellac wax, spermaceti, lanolin (wool wax), animal tail fat, ceresin, ozocerite (earth wax), petrolatum, paraffin waxes, microwaxes; chemically modified waxes (hard waxes), are for example montan ester waxes, Sasol waxes, hydrogenated jojoba waxes and also synthetic waxes such as for example polyalkylene waxes and polyethylene glycol waxes. Besides the fats, fat-like substances such as lecithins and phospholipids are also considered as additives. The term lecithins is understood by one skilled in the art to mean those glycero-phospholipids that are formed from fatty acids, glycerol, phosphoric acid and choline by esterification. Lecithins are in the trade therefore also [called] phosphatidylcholines (PC). Examples of natural lecithins to be cited are the cephalins, which are also called phosphatide acids, and are derivatives of 1,2-diacyl-sn-glycerol-3-phosphoric acids. On the other hand, phospholipids are usually understood to be mono- and, preferably, diesters of phosphoric acid with glycerol (glycerol phosphates), which are generally counted as fats. In addition, sphingosines or sphingolipids are suitable.

Pearly Luster Waxes

Suitable as pearly luster waxes are for example: alkylene glycol esters, especially ethylene glycol distearate; fatty acid alkanolamides, specifically coco-fatty acid diethanolamide; partial glycerides, specifically stearic acid monoglyceride; esters of polyvalent, possibly hydroxy-substituted carboxylic acids with fatty alcohols with 6 to 22 carbon atoms, specifically long-chain esters of tartaric acid; fats such as for example fatty alcohols, fatty ketones, fatty aldehydes, fatty ethers and fatty carbonates which in total have at least 24 carbon atoms, specifically laurone and distearyl ether; fatty acids such as stearic acid, hydroxystearic acid or behenic acid, ring-opening products from olefin epoxides with 12 to 22 carbon atoms with fatty alcohols with 12 to 22 carbon atoms and/or polyols with 2 to 15 carbon atoms and 2 to 10 hydroxyl groups, and their mixtures.

Viscosity Controlling Agents

Viscosity controlling agents are primarily fatty alcohols or hydroxy-fatty alcohols with 12 to 22 and preferably 16 to 18 carbon atoms and also partial glycerides, fatty acids or hydroxy fatty acids. Preferred is a combination of these substances with alkyl oligoglucosides and/or fatty acid-N-methylglucamides of the same chain length and/or polyglycerol poly-12-hydroxystearates. Suitable thickeners are for example aerosil types (hydrophilic silicic acids), polysaccharides, especially xanthan gum, guar-guar, agar-agar, alginates and tyloses, carboxymethylcellulose and hydroxyethylcellulose, also high molecular-weight polyethyleneglycol mono- and diesters of fatty acids, polyacrylates, (e.g. Carbopol® and Pemulen types from Goodrich; Synthalene® from Sigma; Keltrol types from Kelco; Sepigel types from Seppic; Salcare types from Allied Colloids), polyacrylamides, polymers, polyvinyl alcohol and polyvinylpyrrolidone, surfactants such as for example ethoxylated fatty acid glycerides, esters of fatty acids with polyols such as for example pentaerythritol or trimethylolpropane, fatty alcohol ethoxylates with limited distribution of homologs or alkyl oligoglucosides as well as electrolytes such as common salt and ammonium chloride.

Superfatting Agents

Substances that can be used as superfatting agents are for example substances such as lanolin and lecithin and also polyethoxylated or acylated lanolin and lecithin derivatives, polyol fatty acid esters, monoglycerides and fatty acid alkanolamides, with the latter simultaneously serving as foam-stabilizers.

Stabilizers

Substances that can be used as stabilizers are metal salts of fatty acids, such as for example magnesium, aluminum and/or zinc stearate or ricinoleate.

Polymers

Suitable cationic polymers are for example cationic cellulose derivatives, such as for example a quaternized hydroxyethylcellulose that is available under the name Polymer JR 400® from Americol, cationic starches, copolymers of diallylammonium salts and acrylamides, quaternized vinylpyrrolidone/vinylimidazole polymers such as for example Luviquat® (BASF), condensation products of polyglycols and amines, quaternized collagen polypeptides such as for example lauryl dimonium hydroxypropyl hydrolyzed collagen (Lamequat®, Grunau), quaternized wheat polypeptides, polyethylimine, cationic silicone polymers such as for example amodimethicone, copolymers of adipic acid and dimethylaminehydroxypropyl diethylenetetramine (Carteretine®/Sandoz), copolymers of acrylic acid with dimethyldiallylammonium chloride (Merquat® 550/Chemviron), polyaminopolyamides such as for example described in **FR 2252840 A** as well as their cross-linked water-soluble polymers, cationic chitin derivatives such as for example quaternized chitosan, possibly in microcrystalline dispersion, condensation products of dihalogen alkyls such as for example dibromobutane with bisdialkylamines such as for example bisdimethylamino-1,3-propane, cationic guar gum such as for example Jaguar® CBS, Jaguar® C-17, Jaguar® C-16 from the Celanese company, quaternized ammonium salt polymers such as for example Mirapol® A-15, Mirapol® AD-1, Mirapol® AZ-1 from the Miranol company.

Suitable as anionic, zwitterionic, amphoteric and non-ionic polymers are for example vinyl acetate/crotonic acid copolymers, vinylpyrrolidone/vinyl acrylate copolymers, vinyl acetate/butyl maleate/isobornyl acrylate copolymers, methyl vinyl ether/maleic anhydride copolymers and their esters, non-cross-linked polyacrylic acids and polyacrylic acids cross-linked with polyols, acrylamidopropyltrimethylammonium chloride/acrylate copolymers, octylacrylamide/methyl methacrylate/tert-butylaminoethyl methacrylate/2-hydroxypropyl methacrylate copolymers, polyvinylpyrrolidone, vinylpyrrolidone/vinyl acetate copolymers, vinylpyrrolidone/dimethylaminoethyl methacrylate/vinyl caprolactam terpolymers as well as possibly derivativized cellulose ethers and silicones. Other suitable polymers and thickeners are listed in **Cosm. Toil. 108, 95 (1993)**.

Silicone Compounds

Suitable silicone compounds are for example dimethylpolysiloxanes, methylphenylpolysiloxanes, cyclic silicones and also amino-, fatty acid-, alcohol-, polyether-, epoxy-, fluoro-, glycoside-, and/or alkyl-modified silicone compounds which at room temperature can exist in both liquid and also resin form. Also suitable are simethicones, which involve mixtures of dimethicones with an average chain-length of 200 to 300 dimethylsiloxane units and hydrated silicates. In addition, there is a detailed survey of suitable volatile silicones by Todd et al. in **Cosm. Toil. 91, 27 (1976)**.

UV Filters and Anti-oxidants

As UV filters are for example to be understood organic substances (sunscreens), that are liquid or crystalline at room temperature, and are able to absorb ultraviolet radiation and emit the energy absorbed in the form of longer-wave radiation, e.g. heat. UV-B filters can be oil-soluble or water-soluble. Oil-soluble substances that can be cited are for example:

- 3-benzylidenecamphor or 3-benzylidenenorcamphor and its derivatives, e.g. 3-(4-methylbenzylidene)camphor as described in EP 0693471 B1;
- 4-aminobenzoic acid derivatives, preferably 4-(dimethylamino)benzoic acid 2-ethylhexyl ester, 4-(dimethylamino)benzoic acid 2-octyl ester and 4-(dimethylamino)benzoic acid amyl ester;
- esters of cinnamic acid, preferably 4-methoxycinnamic acid 2-ethylhexyl ester, 4-methoxycinnamic acid propyl ester, 4-methoxycinnamic acid isoamyl ester, 2-cyano-3,3-phenylcinnamic acid 2-ethylhexyl ester (Octocrylene);
- esters of salicylic acid, preferably salicylic acid 2-ethylhexyl ester, salicylic acid 4-isopropylbenzyl ester, salicylic acid homomenthyl ester;
- derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone, 2- hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-dihydroxy-4-methoxybenzophenone;

- esters of benzalmalonic acid, preferably 4-methoxybenzalmalonic acid di-2-ethylhexyl ester;
- triazine derivatives such as for example 2,4,6-trianilino-(p-carbo-2'-ethyl-1'-hexyloxy)-1,3,5-triazine and octyl triazone, as described in EP 0818450 A1 or dioctylbutamido-triazone (Uvasorb® HEB);
- propane-1,3-diones such as for example 1-(4-tert-butylphenyl)-3-(4'-methoxyphenyl)propane-1,3-dione;
- ketotricyclo(5.2.1.0)decane derivatives as described in EP 0694521 B1

Suitable water-soluble substances are:

- 2-phenylbenzimidazole-5-sulfonic acid and its alkali, earth alkali, ammonium, alkylammonium, alkanolammonium and glucammonium salts;
- sulfonic acid derivatives of benzophenones, preferably 2- hydroxy-4-methoxybenzophenone-5-sulfonic acid and its salts;
- sulfonic acid derivatives of 3-benzylidenecamphor such as for example 4-(2-oxo-3-bornylidenemethyl)benzenesulfonic acid and 2-methyl-5-(2-oxo-3-bornylidene)sulfonic acid and their salts.

As typical UV-A filters, derivatives of benzoylmethane are particularly suitable, such as for example 1-(4'-tert-butylphenyl)-3-(4'-methoxyphenyl)propane-1,3-dione, 4-tert-butyl-4'-methoxydibenzoylmethane (Parsol® 1789), 1-phenyl-3-(4'-isopropylphenyl)propane-1,3-dione as well as enamine compounds as described in **DE 19712033 A1** (BASF). The UV-A and UV-B filters can of course also be used in mixtures. Especially favorable combinations consist of the derivatives of benzoylmethane, e.g. 4-tert-butyl-4'-methoxydibenzoylmethane (Parsol® 1789) and 2-cyano-3,3-phenylcinnamic acid 2-ethylhexyl ester (Octocrylene) in combination with esters of cinnamic acid, preferably 4-methoxycinnamic acid 2-ethylhexyl ester and/or 4-methoxycinnamic acid propyl ester and/or 4-methoxycinnamic acid isoamyl ester. Advantageously, combinations of this kind are combined with water-soluble filters such as for example 2-phenylbenzimidazole-5-sulfonic acid and their alkali-, earth alkali-, ammonium-, alkylammonium, alkanolammonium- and glucammonium salts.

In addition to the soluble substances mentioned, insoluble light-protective pigments, i.e. finely-dispersed metal oxides or salts are also suitable for this purpose. Examples of suitable metal oxides are in particular zinc oxide and titanium dioxide and also oxides of iron, zirconium, silicon, manganese, aluminum and cerium and their mixtures. As salts, silicates (talc), barium sulfate or zinc stearate can be added. The oxides and salts are used in the form of the pigments for emulsions and decorative cosmetics for the care and protection of the skin. The particles should

have an average diameter of less than 100 nm, preferably between 5 and 50 nm and in particular between 15 and 30 nm. They can have a spherical shape, but particles can also be used that have an ellipsoidal shape or one that deviates in other ways from the spherical. The particles can also be surface-treated, i.e. hydrophilized or water-proofed. Typical examples are coated titanium dioxides such as for example titanium dioxide T 805 (Degussa) or Eusolex® T2000 (Merck). Particularly suitable as hydrophobic coating materials are silicones and specifically trialkoxyoctylsilanes or simethicones. In sunscreens, so-called micro- or nanopigments are preferred. Micronized zinc oxide is used preferably. Other suitable UV screens are to be found in the survey by P. Finkel in **SOFW-Journal 122, 543 (1996)** and **Parf. Kosm. 3, 11 (1999)**.

In addition to the above-mentioned groups of primary sunscreens, secondary sunscreens of the anti-oxidant type can also be used, that interrupt the photochemical reaction chain that is triggered when UV radiation penetrates the skin. Typical examples of this are amino acids (e.g. glycine, histidine, tyrosine, tryptophan) and their derivatives, imidazoles (e.g. urocaninic acid) and their derivatives, peptides such as D,L-carnosine, D-carnosine, L-carnosine and their derivatives (e.g. anserine), carotenoids, carotenes (e.g. α-carotene, β-carotene, lycopene) and their derivatives, chlorogenic acid and its derivatives, liponic acid and its derivatives (e.g. dihydroliponic acid), aurothioglucose, propylthiouracil and other thiols (e.g. thioredoxin, glutathione, cysteine, cystine, cystamine and their glycosyl, N-acetyl, methyl, ethyl, propyl, amyl, butyl, and lauryl, palmitoyl, oleyl, γ-linoleyl, cholesteryl, and glyceryl esters) as well as their salts, dilaurylthiodipropionate, distearylthiodipropionate, thiodipropionic acid and its derivatives (esters, ethers, peptides, nucleotides, nucleosides, and salts) as well as sulfoximine compounds (e.g. buthionine sulfoximine, homocysteine sulfoximine, buthionine sulfone, penta-, hexa, heptathionine sulfoximine) in very tiny well-tolerated dosages (e.g. pmol to μmol/kg), also (metal)-chelators (e.g. α-hydroxy fatty acids, palmitic acid, phytic acid, lactoferrin), α-hydroxyacids (e.g. citric acid, lactic acid, malic acid), humic acid, bile acids, bile extracts, bilirubin, biliverdin, EDTA, EGTA and its derivatives, unsaturated fatty acids and their derivatives (e.g. γ-linolenic acid, linoleic acid, oleic acid), folic acid and its derivatives, ubiquinone and ubiquinol and their derivatives, Vitamin C and derivatives (e.g. ascorbyl palmitate, Mg-ascorbyl phosphate, ascorbyl acetate), tocopherols and derivatives (e.g. Vitamin E acetate), Vitamin A and derivatives (Vitamin A palmitate) and also coniferyl benzoate of benzoin gum, rutinic acid and its derivatives, α-glycosylrutin, ferulic acid, furfurylideneglucitol, carnosine, butylhydroxytoluene, butylhydroxyanisole, nordihydroguaiac resin acid, nordihydroguaiaretic acid, trihydroxybutyrophenone, uric acid and its derivatives, mannose and its derivatives, superoxide dismutase, zinc and its derivatives (e.g. ZnO, $ZnSO_4$), selenium and its derivatives (e.g. methionine selenide), stilbene and its derivatives (e.g. stilbene oxide, trans-stilbene oxide) and the derivatives suitable according to the invention (salts, esters, ethers, sugars, nucleotides, nucleosides, peptides and lipids) of these active components mentioned.

Biogenic Active Components

Among the biogenic active substances within the scope of the invention are also to be understood those that do not arise from the plants described, such as for example tocopherol acetate, tocopherol palmitate, ascorbic acid, (desoxy)ribonucleic acid and its fragmentation products,

retinol, bisabolol, allantoin, phytanetriol, panthenol, AHA acids, ceramides, pseudoceramides, essential oils, other plant extracts and additional vitamin complexes.

Film-formers

Useful film-formers are for example chitosan, microcrystalline chitosan, quaternized chitosan, polyvinylpyrrolidone, vinylpyrrolidone-vinyl acetate copolymer, polymers of the acrylic acid series, quaternary cellulose derivatives, collagen, hyaluronic acid and its salts, and similar compounds.

Swelling Preparations

Swelling preparations for aqueous phases can be montmorillonite, clay minerals, Pemulen and alkyl-modified types of Carbopol (Goodrich). Other suitable polymers or swelling preparations can be obtained from the survey by R. Lochhead in **Cosm. Toil. 108, 95 (1993)**.

Artificial Tanning Agents and Depigmentation Preparations

Dihydroxyacetone is suitable as an artificial tanning agent. Suitable as tyrosinase inhibitors that prevent the formation of melanin and find application in depigmentation preparations, are for example arbutin, ferulic acid, kojic acid, cumarinic acid and ascorbic acid (Vitamin C).

Hydrotropes

To improve flow behavior, hydrotropes such as ethanol, isopropyl alcohol or polyols, can also be used. Polyols that are suitable here preferably have 2 to 15 carbon atoms and at least two hydroxyl groups. The polyols can contain additional functional groups, in particular amino groups or can be modified with nitrogen. Typical examples are:

- glycerol;
- alkylene glycols, such as for example ethylene glycol, diethylene glycol, propylene glycol, butylene glycol, hexylene glycol, and also polyethylene glycols with an average molecular weight of 100 to 1000 daltons;
- technical oligoglycerol mixtures with a self-condensation rate of 1.5 to 10, such as technical diglycerol mixtures with a diglycerol content of 40 to 50% by weight;
- methylol compounds such as in particular trimethylolethane, trimethylolpropane, trimethylolbutane, pentaerythritol and dipentaerythritol;
- Lower alkyl glucosides, in particular those with 1 to 8 carbon atoms in the alkyl residue, such as for example methyl- and butylglucoside;
- sugar alcohols with 5 to 12 carbon atoms such as for example sorbitol or mannitol;
- sugars with 5 to 12 carbon atoms such as for example glucose or saccharose'

- aminosugars, such as for example glucamine;

- dialcoholamines such as diethanolamine or 2-amino-1,3-propanediol.

Preservatives

Suitable preservatives are for example phenoxyethanol, formaldehyde solution, parabens, pentanediol or sorbic acid as well as other classes of substances listed in Schedule 6, Part A and B of the Cosmetics Regulation.

Perfume Oils

Cited as perfume oils are mixtures of natural and synthetic perfumes. Natural perfumes are extracts of flowers (lily, lavender, roses, jasmine, orange blossom, ylang-ylang), stems and leaves (geranium, patchouli, petitgrain), fruits (anise, coriander, caraway, juniper), fruit peels (bergamot, lemons oranges), roots (mace, angelica, celery, cardamom, costus, iris, calamus), woods (pine, sandalwood, guaiac, cedar, rosewood), herbs and grasses (tarragon, lemon grass, sage, thyme), needles and branches (spruce, fir, pine, dwarf pine), resins and balsams (galbanum, elemi, benzoin, myrrh, olibanum, opoponax). Also suitable are animal raw materials such as for example civet and castoreum. Typical synthetic perfume compounds are products of the ester, ether, aldehyde, ketone, alcohol, and hydrocarbon type. Perfume compounds of the ester type are for example benzyl acetate, phenoxyethyl isobutyrate, p-tert-butylcyclohexyl acetate, linalyl acetate, dimethylbenzylcarbinyl acetate, phenylethyl acetate, linalyl benzoate, benzyl formate, ethylmethylphenyl glycinate, allylcyclohexyl propionate, styrallyl propionate, and benzyl salicylate. Among the ethers is for example benzyl ethyl ether, among the aldheydes are for example the linear alkanals with 8 to 18 carbon atoms, citral, citronellal, citronellyloxy acetaldehyde, cyclamenaldehyde, hydroxycitronellal, lilial and bourgeonal, among the ketones are for example the ionones, α-isomethylionone and methyl cedryl ketone, among the alcohols are anethole, citronellol, eugenol, isoeugenol, geraniol, linalool, phenylethyl alcohol, and terpineol, among the hydrocarbons are mainly the terpenes and balsams. Preferably used, however, are mixtures of different perfumes that together create an attractive fragrance note. Ethereal oils of low volatility, that are mostly used as aroma components are also suitable as perfume oils, e.g. sage oil, camomile oil, clove oil, verbena oil, mint oil, cinnamon leaf oil, linden flower oil, juniper berry oil, vetiveria oil, olibanum oil, galbanum oil, labolanum oil and lavendin oil. Preferably, bergamot oil, dihydromyrcenol, lilial, lyral, citronellol, phenylethyl alcohol, α-hexylcinnamaldehyde, geraniol, benzyl acetone, cyclamenaldehyde, linalool, Boisambrene Forte, ambroxan, indole, hedione, sandelice, lemon oil, mandarin oil, orange oil, allylamyl glycolate, cyclovertal, lavendin oil, muscatel sage oil, β-damascone, geranium oil bourbon, cyclohexyl salicylate, Vertofix Coeur, Iso-E-Super, Fixolide NP, Evernyl, Iraldein gamma, phenylacetic acid, geranyl acetate, benzyl acetate, rose oxide, Romillat, Irotyl and Floromat are used alone or in mixtures.

Color Additives

Color additives that can be used are substances that are suitable and permitted for cosmetic purposes such as are for example listed in the publication **"Cosmetic Color Additives"** of the

Dyestuff Commission of the German Research Society, Verlag Chemie, Weinheim, 1984, pp. 81-106. These color additives are usually used in concentrations of 0.001 to 0.1% by weight, based on the total mixture.

Examples

1. Example: Preparation of the extract from the Hamamelis plant
Two kg dried Hamamelis virginiana extract were dissolved in a mixture of 48 kg distilled water and 49 kg propylene glycol at room temperature with stirring, and then filtered. The dried extract was obtained by purchase.

2. Example: Extraction of the Arnica montana plants
Ten kg Arnica montana flowers in a mixture of 44 kg distilled water and 45 kg propylene glycol were extracted by maceration with stirring at room temperature for 48 hours. The extraction mixture was then filtered.

3. Example: Preparation of the extract from Hypericum perforatum plants
Two kg dried extract from Hypericum perforatum were dissolved in a mixture of 48 kg distilled water and 49 kg propylene glycol at room temperature with stirring. The solution was then filtered. The dried extract was purchased.

4. Example: Preparation of the extract of the Salix alba plant
Fifteen kg of the bark of Salix alba in a mixture of 66 kg distilled water and 66 kg propylene glycol were extracted at 80°C for 3 hours. The solution was then filtered.

5. Preparation of hydrolyzed soy proteins
Fifteen kg soy meal were extracted with distilled water at 55°C for 4 hours. The extraction mixture was then centrifuged. For the hydrolysis, it was then enzymatically hydrolyzed with a protease, first at pH 8.7 and 54°C for 4 hours, and then at pH 3.6 and 54°C for 160 min. To inactivate the enzymes, the mixture was heated to 95°C for one hour and the protein mixture obtained was filtered. The solution contained 9% by weight dry substance and 4% by weight proteins.

6. Composition of the synergistically active mixture
The synergistically active mixture which is added to the preparations for the invention applications has for example preferably the following composition (in % by weight). This mixture is for example obtainable under the trade name Pilinhib® VEG. This is a trade mark of the COGNIS group.

Hydrolyzed soy protein	72.75%
Hypericum perforatum extract	7.00%
Hamamelis virginiana extract	6.00%
Arnica montana flower extract	6.00%
Urea	4.00%
Salix alba bark extract	3.00%

Menthol	1.00%
Salicylic acid	0.25%

This mixture contains, among other things, from the extracts of Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba, between 25 and 40% by weight of propylene glycol from the water and propylene glycol solvent.

For the sake of simplicity, in the following examples Pilinhib® VEG will be spoken of, but what is meant however are mixtures that have the above mentioned composition.

7. Preparation of the synergistically active mixture

The menthol and salicylic acid were dissolved in propylene glycol at 50°C. All other components were added at room temperature with stirring. The mixture was then centrifuged and filtered.

8. Test of inhibition of hair growth

A deodorant in lotion form containing 5% by weight Pilinhib® VEG was tested against a placebo (deodorant without Pilinhib® VEG) on the underarms of 12 volunteer healthy men and women of ages from 18 to 50 years. In all test subjects there of course existed a strong, rapid growth of hair under the arms.

Before the individual treatment it was determined in each case what growth of hair under the arms was to be expected after 10 days. For this purpose, the underarms of the test persons were shaved, and after ten days the length and diameter of the hair was determined by macrophotography.

For the determination of the hair growth-inhibiting properties, the products were applied twice a day (morning and evening) over a period of ten days. Before the treatment, both armpits were shaved. For the direct comparison, in each case one armpit was treated with the lotion containing 5% by weight Pilinhib® VEG and the other armpit with the lotion without Pilinhib® VEG. After the ten-day treatment, the length and diameter of the hair was determined by macrophotography.

	D20/D10
Deodorant with 5% by weight Pilinhib® VEG	42%
Placebo deodorant	0%

Table 1: Determination of hair length and hair diameter

D10 = 10 days after shaving without treatment D20 = 10 days after shaving with treatment

After only 10 days of treatment, the hair length and hair diameter of the volunteers was reduced by 42% compared with the absence of treatment. In the treatment with placebo, no change in the hair length could be established in comparison to the absence of treatment.

Patent Claims

1. Use of a preparation containing a synergistically active mixture that inhibits hair growth, containing hydrolyzed soy protein and at least one extract of a plant selected from the group constituted by Hypericum perforatum, Hamamelis virginiana, Arnica montana and Salix alba.

2. Use as in claim 1, characterized by the fact that the synergistically active mixture also contains substances that are selected from the group constituted by urea, menthol, propylene glycol and salicylic acid.

3. Use as in one of the claims 1 and/or 2, characterized by the fact that the extracts from Hamamelis virginiana preferably stem from the leaves of the plant, the extracts from Arnica montana preferably stem from the flowers, and the extracts from Salix alba preferably stem from the bark.

4. Use of a preparation as in one of the claims 1 to 3 as a deodorant and/or antiperspirant.

5. Use of a preparation as in one of the claims 1 to 3 as an after-shave.

6. Use as in one of the claims 1 to 5, characterized by the fact that the components in the synergistically active mixture contained in the preparations in accordance with claims 1 to 5 have the following composition:

   (c) 0.01 to 40% by weight hydrolyzed protein from soy extract
   (d) 0.005 to 10% by weight Hypericum perforatum extract and/or
   (h) 0.005 to 10% by weight Hamamelis virginiana extract and/or
   (i) 0.005 to 10% by weight Arnica montana extract and/or
   (j) 0.001 to 10% by weight Salix alba extract and **if necessary**
   (k) 0.0005 to 10% by weight menthol
   (l) 0.0005 to 10% by weight urea
   (m) 0.005 to 40% by weight propylene glycol
   (n) 0.0005 to 3% by weight salicylic acid

   provided that if necessary the amounts are made up to 100% by weight with water and/or other adjuvants and additives.

7. Use as in one of the claims 1 to 5, characterized by the fact that the synergistically active mixture has the following composition:

   72.75% by weight hydrolyzed soy protein
   7% by weight Hypericum perforatum extract and
   6% by weight Hamamelis virginiana extract and
   6% by weight Arnica montana extract and
   3% by weight Salix alba extract and
   4% by weight urea and
   1% by weight menthol and
   0.25% by weight salicylic acid